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(54) Crossbow trigger apparatus

(57) A crossbow includes a trigger 40 pivotally mounted on the stock, a bowstring catch 50 pivotally mounted on the stock a substantial distance rearward of the trigger, and an elongated pivotal rod 60 extending between the trigger and the catch. Pivotal movement of the trigger causes pivoting of the rod to release the catch to permit release of the cocked bowstring 32. A locking mechanism 72 may be provided. The catch may be integrally formed on the rear end of the rod.

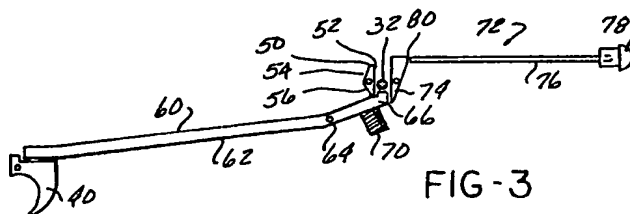
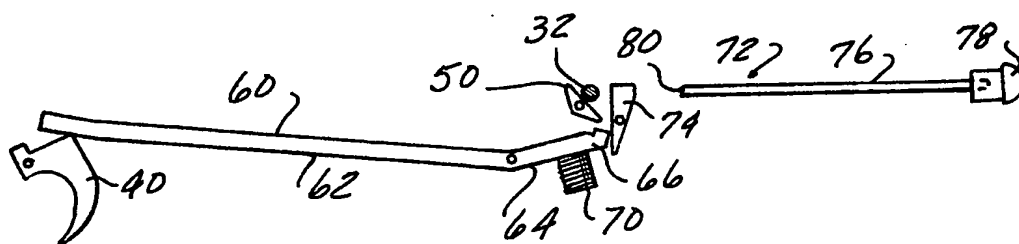
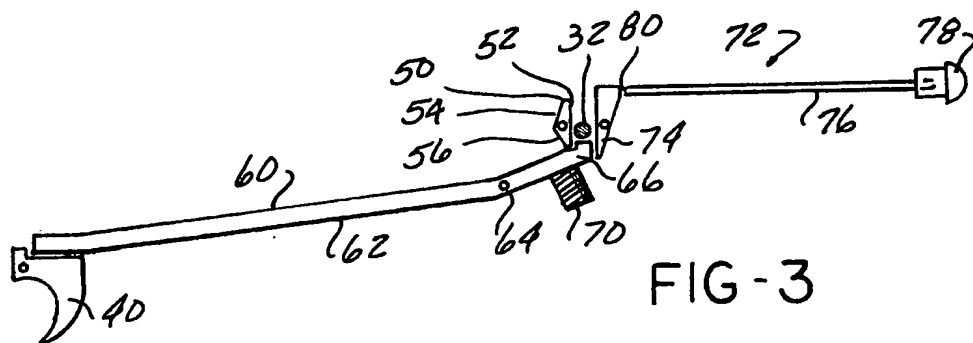
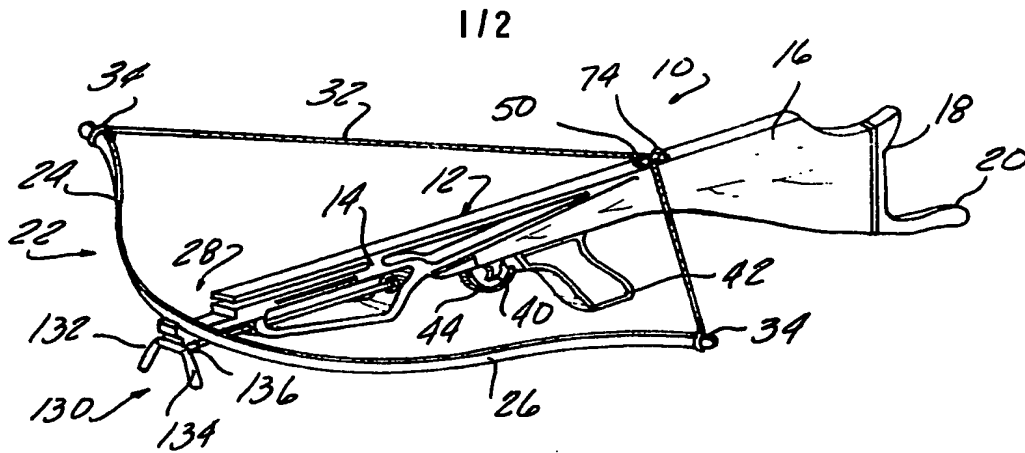
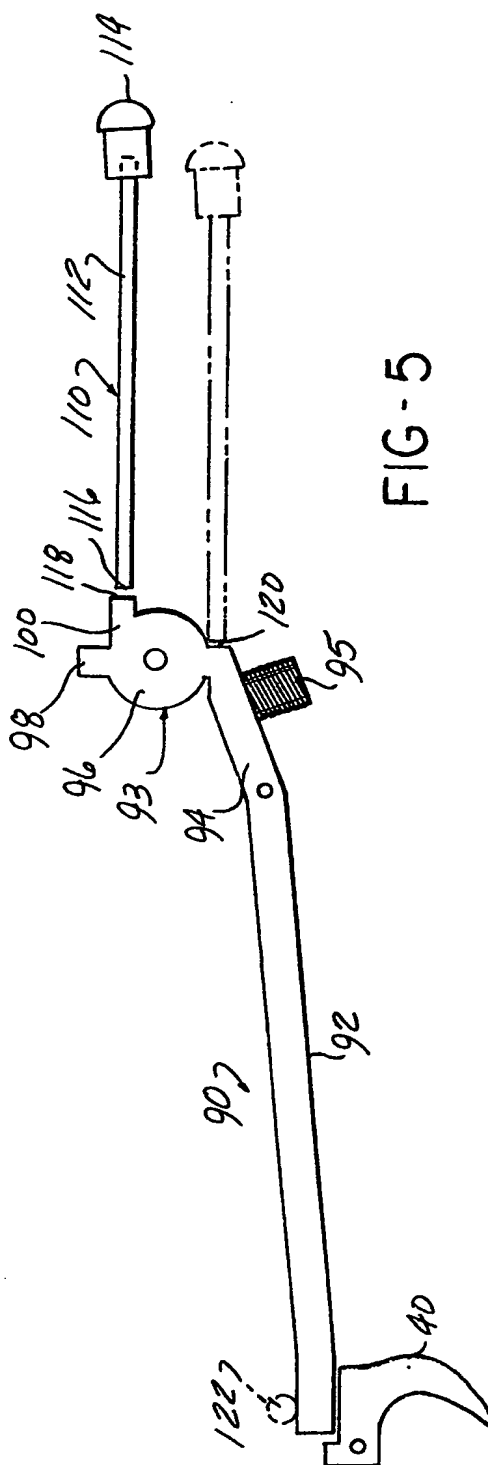
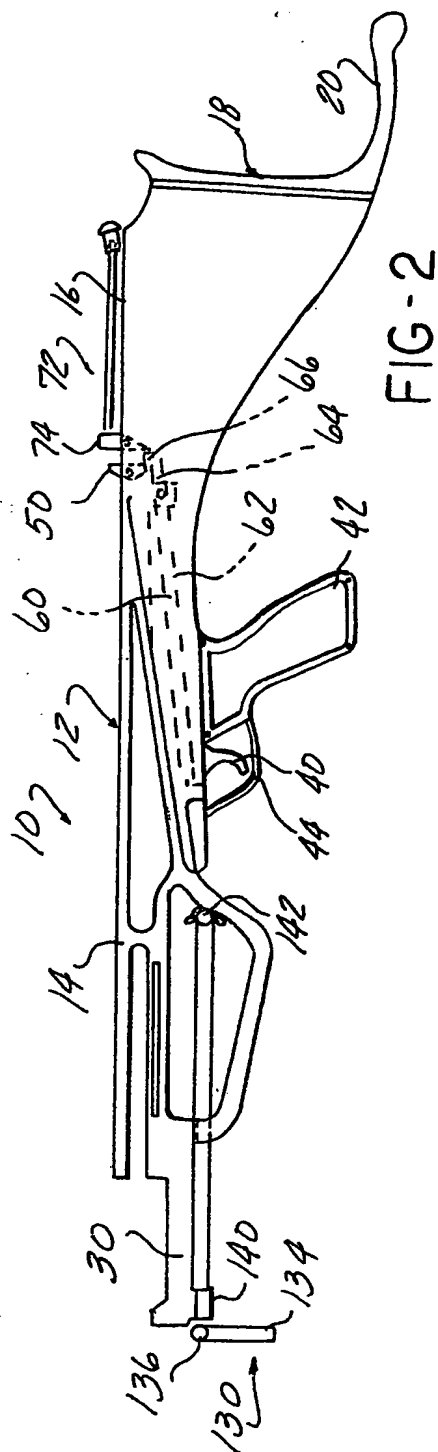


FIG-3

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SPECIFICATION

Crossbow trigger apparatus

5 This invention relates, in general, to crossbows and, more specifically, to triggers for crossbows.

Crossbows have been used for centuries in military and hunting applications, as well as fishing and target shooting. Crossbows include a rifle-like stock having a butt and a fore end. An arrow or bolt moves along a guide formed along the upper surface of the stock. A prod having outwardly extending arms is mounted on the fore end of the crossbow and a bowstring is connected to opposed ends of the prod. The bowstring is drawn back and held by a releasable catch to apply tension to the bowstring which, when released, propels the arrow or bolt in the direction in which the crossbow was aimed.

20 A trigger is connected to the catch for releasably latching the catch in the bowstring retracted position. In a conventional crossbow, the catch is located directly above or in close proximity to the trigger.

25 Thus, it would be desirable to provide a unique crossbow which includes an improved trigger apparatus.

The present invention is a crossbow trigger apparatus which includes a trigger pivotally mounted on the stock of a crossbow. A bowstring catch is pivotally mounted on the stock a substantial distance rearward of the trigger for releasably retaining a bowstring in the cocked position. An elongated pivotal lever extends between the trigger and the catch and holds the catch in the bowstring retracted position when in a first position. Movement of the trigger pivots the elongated rod to a position which releases the catch and the bowstring to propel the bolt forward.

40 The crossbow trigger apparatus of the present invention provides significant advantages over previously devised trigger mechanisms employed on crossbows. By interconnecting the trigger and the bowstring catch by an elongated pivotal rod, the catch may be mounted rearward on the crossbow stock a substantial distance rearward of the trigger.

The various features, advantages and other uses of the present invention will become more apparent by referring to the following detailed description and drawing in which:

Figure 1 is a perspective view of a crossbow incorporating a trigger apparatus constructed in accordance with the teachings of the present invention;

55 *Figure 2* is a side-elevational view of the crossbow shown in *Figure 1*;

Figure 3 is a partial elevational view showing the position of the components of the trigger apparatus of the present invention when in the cocked position;

60 *Figure 4* is a partial, side-elevational view showing one embodiment of the trigger apparatus of the present invention with the components disposed in their fired positions; and

65 *Figure 5* is a partial, side-elevational view of an

other embodiment of the trigger apparatus of the present invention.

70 Throughout the following description and drawing, an identical reference number is used to refer to the same component shown in multiple figures of the drawing.

Referring now to the drawing, and to *Figures 1* and *2* in particular, there is illustrated a crossbow 10 constructed in accordance with the teachings of the present invention. The crossbow 10 includes a stock 12 having a front barrel section 14 and a butt 16 which is connected to the front barrel section 14. A butt pad 18 is connected to the end of the butt 16 and includes an outwardly extending, arcuate-shaped support arm 20.

80 A two-piece bow prod 22 is fixedly mounted on the front end portion of the front barrel section 14. The bow prod 22 includes two outwardly extending prod arms 24 and 26 which are pivotally connected at one end in a bracket 28. The mounting bracket 28 is secured to a recessed portion 30 on the front end of the front barrel section 14 of the stock 12. A bowstring 32 is connected by conventional fasteners 34 to the opposite ends of the bow prod arms 24 and 26.

90 One embodiment of a bowstring release mechanism is shown in *Figures 2, 3, and 4*. The bowstring release mechanism includes a trigger 40 which is pivotally mounted within a central portion of the stock 12. The trigger 40 has an arcuate configuration with a curved surface to receive a finger of the user of the crossbow 10. A trigger handle grip 42 and trigger guard 44 are also formed on the stock 12 and surround the trigger 40.

100 A bowstring catch 50 is pivotally mounted on the crossbow 10. The catch 50, according to the embodiment shown in *Figures 2, 3 and 4*, comprises a pivotal member having a flat surface 52 and arcuately shaped surfaces 54 and 56. The flat surface 52 functions to releasably retain the bowstring 32 in the cocked position, as shown in *Figure 1*.

As shown in *Figures 3 and 4*, the catch 50 is movable from a first bowstring retaining position to a second bowstring releasing position shown in *Figure 4*.

110 An elongated, pivotal rod 60 is pivotally mounted within the front barrel section 14 of the stock 12 and extends between the trigger 40 and the catch 50. The rod 60 has an angular configuration formed of a first portion 62 and a second portion disposed at an acute angle 64 with respect thereto. The second portion 64 terminates in a notched end 66.

120 The rod 60 functions to interconnect the trigger 40 and the catch 50 and is movable between first and second positions, as respectively shown in *Figures 3 and 4*. When in the first position, as shown in *Figure 3*, the notched end 66 of the elongated rod 60 catches and retains the catch 50 in the first bowstring retaining position such that the flat surface 52 of the catch 50 is disposed in a substantially vertical orientation. In the second position shown in *Figure 4*, the elongated rod 60 pivots such that the notched end 66 moves away from the catch 50, thereby allowing the tension on the

cocked bowstring 32 to cause pivotal movement of the catch 50 and enable the bowstring 32 to move over the catch 50.

Means are provided for biasing the pivotal rod 5 60 to the first position. Preferably, the biasing means 70 is in the form of a coil spring mounted within the stock 12 in contact with the second angular portion 64 of the rod 62.

The crossbow 10 is provided with lock means, denoted in general by reference number 72. The lock means 72 functions as safety to lock and prevent pivotal movement of the catch 50 when it is not desired to fire the crossbow 10.

The lock means 72 includes a lock member 74 15 pivotally mounted within the stock 14. The lock member 74 has a depending portion 76 which engages the notched end 66 of the elongated rod 60 when the rod 60 is in the first bowstring retaining position, shown in Figure 3. A movable lock member 74 having an outer button 78 mounted thereon 20 is positioned within the butt 16 and is movable between first and second positions. In the first or locked position, as shown in Figure 3, one end 80 of the lock rod 76 abuts a surface or edge of the 25 lock member 74 and prevents pivotal movement of the lock member. An opposite end of the lock member 74 engages the notched end 66 of the rod 60 upon depression or movement of the trigger 40. A rearward movement of the lock rod 76, as shown 30 in Figure 4, releases engagement between one end 80 of the lock rod 76 and the pivotal lock member 74 so as to permit pivotal movement of the lock member 74 and release the catch 50 and the bowstring 32 to fire the crossbow 10.

A second embodiment of the trigger apparatus 35 of the present invention is shown in Figure 5. In this embodiment, an elongated rod 90 is pivotally mounted within the stock 14 and extends between the trigger 40 and a pivotal catch projection 92 40 formed at one end of the rod 90. The elongated rod 90 has a form substantially similar to the rod 60 shown in Figures 3 and 4 and includes a first portion 92 and an angularly positioned portion 94 integrally formed therewith. Biasing means 95 in 45 the form of a coil spring urges against the second portion 94 to urge the rod 90 to the first bowstring retaining position as previously described. The elongated rod 90 is formed with an end portion 93 having a circular configuration which is provided 50 with a first outwardly extending projection or arm 98. The projection 98 functions as the catch for the bowstring 32 in the same manner as the pivotal catch 50 described above and illustrated in Figures 3 and 4. As such, movement of the trigger 40 will 55 cause pivotal movement of the rod 90 to rotate the end member 98 about its pivotal axis and thereby release the bowstring 32.

The lock means 110 shown in Figure 5 for the 60 trigger mechanism illustrated in Figure 5 may be provided at several different locations on the trigger mechanism. As shown in solid lines in Figure 5, the lock mechanism 110 includes an elongated rod 112 and a lock button 114 which are mounted on top of the butt 16 of the crossbow 10 such that 65 one end 116 of the lock rod 112 biases an out-

wardly projecting projection 118 formed on the circular end member 96 of the rod 90 so as to releasably lock the rod 90 in a cocked position until the locking rod 110 is pulled backward.

70 The lock mechanism 110 may also be positioned at several other locations with respect to the elongated rod 90 as shown in phantom lines in Figure 5. In one alternate position, the leading edge of the locking rod 110 may seat against a notched portion 120 formed between the circular portion 96 and the 75 angular portion 94 of the rod 90. Alternately, the locking rod 110 may assume a position shown in phantom lines in Figure 5 and denoted in general by reference number 122 in which the locking rod 112 is oriented transversely to the rod 90 and ex- 80 tends over the front end of the rod 92 to prevent any pivotal movement of the rod even if the trigger 40 is moved.

As shown in Figures 1 and 2, the crossbow 10 is 85 also provided with a foot support 130 for aiding the user in drawing the bowstring 32 rearward to the catch 50. The foot support is mounted at the forward end of the stock 12 and is in the form of an angular member having legs 132 and 134 which 90 are joined by a planar central portion 136. An elongated rod 138 is joined to the central portion 136 and is telescopingly slidable through a sleeve 140 mounted on the forward end 14 of the stock 12. The opposed ends of the rod 138 releasably fit 95 within a slip 142 mounted on the stock so as to enable the foot support 130 to be extended for use in drawing the bowstring 132 rearward over the catch 150 or collapsed for convenient carrying within the barrel section 14 of the crossbow 10.

100 In summary, there has been disclosed a unique trigger mechanism for a crossbow which positions the bowstring catch a substantial distance rearward of the trigger.

105 CLAIMS

1. A bowstring release apparatus for a crossbow having a stock, bow and bowstring comprising:

110 a catch pivotally mounted in the stock and movable between a first position for retaining a bowstring in a cocked position and a second position to release the bowstring;

a trigger pivotally mounted in the stock; and

115 an elongated rod pivotally mounted in the stock and movable between first and second positions, the rod having first and second ends and extending rearward in the stock a substantial distance from the trigger;

120 the rod engaging the trigger at a first end and when in a first position holding the catch in a first position, the rod when pivoted to the second position upon movement of the trigger enables movement of the catch to the second position to release 125 the bowstring.

2. The apparatus of Claim 1 further including means, mounted in the stock, for biasing the rod in the first position.

3. The apparatus of Claim 1 further including 130 lock means for locking the rod in the first position.

4. The apparatus of Claim 3 wherein the lock means includes:
a lock member pivotally mounted in the stock and movable between a first position locking the rod in a first position and a second position releasing the rod for movement to the second position; and
a release rod mounted in the stock for releasably retaining the lock member in the first position.
- 10 5. The apparatus of Claim 1 wherein the catch is integrally formed on the second end of the rod.
6. The apparatus of Claim 5 further including lock means for locking the rod in the first position.
- 15 7. The apparatus of Claim 6 wherein the lock means includes a release rod mounted in the stock and releasably engaging one end of the rod and the catch to releasably retain the rod and the catch in the first position.
- 20 8. The apparatus of Claim 7 wherein the catch includes an outwardly extending projection, the projection being releasably engaged by the release rod.
- 25 9. A cross bow substantially as described herein with reference to, and as shown in, the accompanying drawings.